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ABSTRACT

The Classroom Interaction Analysis Index (CIAI) is an instrument developed to categorize the actions of teachers and students as they interact in classroom situations. In the study described, a class of 30 social studies student teachers were divided into teams of five each. Each team taught the same preplanned lesson twice--by illustrated lecture and through a non-expository method. The lessons were video-taped and, utilizing the CIAI, evaluated by five evaluators: self, peers, an untrained graduate observer, a trained graduate observer, and by the senior researcher. The researchers used analysis of variance to compare the perceptions of the five evaluators, Duncan's Multiple Range Test to determine where the differences occurred, and the t-test to determine if there were significant differences in the perceived behaviors when expository and non-expository methods were used. The appendices contain tables of the findings, a bibliography, and copies of the CIAI, its history, and a guide to its use. (Author/MLF)

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A COMPARISON OF THE PERCEIVED BEHAVIORS OF STUDENTS AND TEACHERS AS MEASURED BY THE CLASSROOM INTERACTION ANALYSIS INDEX

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Statement of the Problem

The problem was to determine if there were significant differences in self-evaluator's, peer evaluator's, untrained graduate evaluator's, trained graduate evaluator's, and veteran evaluator's perceptions of teacher and student behaviors in any of the categories of behavior delineated by the Classroom Interaction Analysis Index when the same micro-lesson was team-taught by social studies student teachers through use of expository and non-expository methods.

As a means of structuring the problem answers were sought to the following questions:

1. Were there significant differences in the perceptions of self-evaluators, peer evaluators, untrained graduate evaluators, and veteran evaluators in any of the categories of behavior defined by the CIAI?
2. If differences were observed, where were the actual differences of perception?
3. Would there be significant differences in the perceived behaviors of the subjects when all evaluators' perceptions of expository lessons were compared to their perceptions of non-expository lessons?

Rationale

There have been a number of efforts to develop suitable instruments and techniques for analysis of classroom interaction and/or categorization of the behavior of teachers and students in classroom situations. Most recognize Arvil Barr's 1929 study as the earliest attempt to develop a thorough means of

analyzing teaching-learning situations. During the 1960's interest in analysis of teaching quickered due to the work of Medley and Mitzel, Ned A. Flanders, Robert Spaulding, Marie Hughes, Edmund Amidon and Elizabeth Hunter Arno Bellack, John Withall and Robert Ribble, Anita Simon and Yvonne Agazarian, B. Othanel Smith, Robert Bales, and many others. (Gage, 1963). (Sandefur and Bressler, 1971). Most of the instruments and techniques developed to analyze teaching require considerable training and experience. Most analyze only verbal behaviors and many require incremental scoring. The Classroom Interaction Analysis Index (CIAI) was developed by the senior researcher at Mississippi State University as part of a long range development of an instrument suitable for analyzing verbal and non-verbal classroom behaviors of both teachers and students. The CIAI is easy to score, requires minimal training, and its' eight types of student behavior and ten types of teacher behavior provide adequate categories for analyzing most classroom behaviors.

The purposes of the present study were: (1) to investigate the relationships of observed teacher behaviors as perceived by various types of evaluators; (2) to investigate where significant differences occurred in the perceptions of these various types of evaluators; (3) to investigate the difference in perceived classroom behaviors when different methods were used; and, (4) to further modify the CIAI, if needed.

Procedures

The population consisted of a class of 30 social studies student teachers. They were divided into teams of five each. Each team taught the same preplanned lesson of its' choice twice. The lessons were video-tape recorded. One lesson was presented by illustrated lecture. The other lesson was taught through a

non-expository method.

Each video-tape was evaluated by five evaluators: self, peers, an untrained graduate observer, a trained graduate observer, and by the senior researcher. The CIAI has 18 categories arranged in six sub-scales. Scoring is done by simply recording a behavior in each category each time it is perceived as occurring. A copy of the CIAI and an explanation of its use is included in the appendix.

Analysis of variance was used to compare the perceptions of the five evaluators. Duncan's Multiple Range Test was used to determine where the differences occurred. The t-Test was used to determine if there were significant differences in the perceived behaviors when expository and non-expository methods were used.

Findings

There were significant difference in the perceptions of the various evaluators on Items 1-10, 14, and 15. The results of Duncan's Multiple Range Test revealed that Items 1, 2, 3, 6, 7, 8, 10, 13 and 15 showed the senior researcher (veteran observer) as perceiving significantly greater number of behaviors. The results of Duncan's Test showed that the graduate observer approached the ratings of the veteran observer after training on Items 1, 2, 3, 6, 7, 13, and 15. The Trained Graduate Observer perceived more behaviors than any other observer on Items 4 and 5. Both the Untrained and Trained Graduate Observer perceived more behaviors on Items 4 and 5 than the Veteran Observer did. The Peer Observers perceived more behaviors on Items 9 and 14 than any other observer, although their perceptions were closely followed by those of the Veteran Observer on Item 9 and by those of the Self Observer on Item 14. Item 13 showed no signi-

ficant difference on the one-way analysis of variance but it showed differences on the Duncan's Multiple Range Test. This was probably due to the small N in this perceived behavior. The senior researcher tended to perceive a greater number of subject matter oriented behaviors, ego reinforcing behaviors, despar aging behaviors, student supportive behaviors, problem structuring behaviors, information seeking behaviors, and student non-involved behaviors than any of the other observers. The graduate observers perceived a greater number of neutral and directive teacher behaviors than any other evaluators.

Results of the t Tests revealed significant differences in Items 1, 2, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15, and 18 when observers' evaluations of the expository and non-expository lesson were compared. Observers recorded significantly more behaviors in the expository lesson for Items 1, 2, 4, and 6. Observers recorded significantly more behaviors in the non-expository lesson in Items 8-15 and 18. Items 1 and 2 are subject oriented. Item 4 is neutral behaviors. Item 6 is teacher ego reinforcing behavior. Items 8-14 are student oriented, accepting, involved behaviors. Items 15 and 18 are student non-involved behaviors.

Based on the results of this study, and the studies using the CIAI which preceded it, it seems reasonable to conclude that observers tend to perceive given classroom interaction patterns more alike after training and experience. It also seems reasonable to conclude that illustrated lecture provides more observable behaviors in the cognitive domain and that non-expository teaching (discovery, inquiry, etc.) provides more observable behaviors in the affective domain.

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APPENDICES

APPENDIX I

Table I
A Comparison of the Perception of Self-Evaluators, Peer Evaluators, Untrained Graduate Evaluators, Trained Graduate Evaluators, and Vetran Evaluators of the Behaviors of Students and Teachers When Micro-Teaching A Social Studies Lesson

Item	Self-Evaluator	Peer Evaluator	Untrained Grad. Evaluator	Trained Grad. Evaluator	Veteran Evaluator	F Ratio
1. Introductory Behaviors	4.3667	4.5500	3.9667	4.8833	5.7000	2.662*
2. Developmental Behaviors	4.0833	5.0167	7.7000	9.3333	10.6333	24.188*
3. Concluding Behaviors	1.9667	2.1333	.8667	1.1000	2.3000	10.711*
4. Neutral Behaviors	6.6833	3.2333	8.2667	8.2667	7.9500	2,490*
5. Directive Behaviors	.6000	.8500	1.2167	1.8000	.9500	4.284*
6. Ego-Reinforcing Behavior	.4167	.4833	.6167	1.6000	2.4000	15.146*
7. Disparaging, Reproving, Discouraging Behaviors	.0667	.1000	.1833	.5167	.6000	5.656*
8. Student Supportive Behaviors	.4500	.7000	.0167	.5500	1.0167	6.125*
9. Student Accepting Behaviors	.4500	.7000	.1667	.4000	.6167	3.646*
10. Problem-Structuring Behaviors	.3500	.3833	.0667	.2833	.8667	7.173*

Item	Self-Evaluator	Peer Evaluator	Untrained Grad. Evaluator	Trained Grad. Evaluator	Veteran Evaluator	F Ratio
11. Clarifying Or Elaborating Behaviors	.7333	.7333	.5000	.5333	.8000	.764
12. Responding Behaviors	1.3167	1.1167	1.2333	1.1167	1.1833	.116
13. Information Seeking Behaviors	.0667	.1333	.3000	.2333	.3333	2.237
14. Student Responses To Student Behaviors	.4000	.4833	.3000	2.2833	3.3000	13.073*
15. Non-Involved Behaviors	.0833	.1167	.0833	.4167	.5833	2.838*
16. Disrupting Behaviors	.1500	.1833	.2667	.2667	.2833	.139
17. Irrelevant Behaviors	.2167	.1167	.2667	.1667	.2333	.213
18. Non-Approach To Learning Behaviors	.1000	.0833	.0833	.0333	.1500	.572

N = 300 observations

* Significant at .05 level

Table 2
Results of Duncan's Multiple Range Test for Comparing
Observers Showing Where Significant Differences Occurred

Item	Observers	F Ratio
Introductory Behaviors	O_5 O_4 O_2 O_1 O_3	2.652*
Developmental Behaviors	O_5 O_4 O_3 O_2 O_1	24.188*
Concluding Behaviors	O_5 O_2 O_1 O_4 O_3	10.711*
Neutral Behaviors	O_4 O_3 O_5 O_1 O_2	2.490*
Directive Behaviors	O_4 O_3 O_5 O_2 O_1	4.284*
Ego Reinforcing Behaviors	O_5 O_4 O_3 O_2 O_1	15.146*
Disparaging, Reproving, Discouraging Behaviors	O_5 O_4 O_3 O_2 O_1	5.656*
Student Supportive Behaviors	O_5 O_2 O_4 O_1 O_3	6.125*
Student Accepting Behaviors	O_2 O_5 O_1 O_4 O_3	3.646*
Problem Structuring Behaviors	O_5 O_2 O_1 O_4 O_3	7.173*
Information Seeking Behaviors	O_5 O_3 O_4 O_2 O_1	2.237 ≠
Student Response To Student Behaviors	O_2 O_1 O_5 O_3 O_4	13.073*
Non-Involved Behaviors	O_5 O_4 O_2 O_1 O_3	2.838*

gnificant at .05 level

m 13 not significantly different; but, the Duncan test shows an observed difference.

ms 11, 12, 16, 17, 18 showed no significant difference.

Table 3
Results of t-Tests To Determine If Significant Difference Occurred In The Perceived Behaviors of Student Teachers Who Micro-Taught The Same Lesson Using Expository Methods and Non-Expository Methods

Items	Expository Method		Non-Expository Method		t Values
	$\bar{X}$	SD	$\bar{X}$	SD	
1. Introductory Behaviors	7.3000	3.654	3.2833	1.119	5.76*
2. Developmental Behaviors	13.5833	4.656	6.3833	2.239	7.63
3. Concluding Behaviors	1.8167	2.347	1.5833	1.314	.48
4. Neutral Behaviors	12.2667	15.126	3.9500	3.534	2.93*
5. Directive Behaviors	1.6333	1.377	1.1167	1.633	1.32
6. Ego Reinforcing Behaviors	2.6000	2.857	1.4000	1.242	2.11*
7. Disparaging Reproving, Discouraging, Behaviors	.6333	.776	.4833	1.221	.57
8. Student Supportive Behaviors	.0000	.000	1.5667	1.665	-5.15*
9. Student Accepting Behaviors	.0000	.000	1.0167	.905	-6.15*
10. Problem Structuring Behaviors	.1000	.548	1.0500	1.012	-4.52*
11. Clarifying Or Elaborating Behaviors	.0000	.000	1.3333	.932	-7.84*
12. Responding Behaviors	.0000	.000	2.3000	1.968	-6.40*
13. Information Seeking Behaviors	.0000	.000	.5667	.796	-3.90*
14. Student Responses To Student Behaviors	.0000	.000	5.5833	4.644	-6.59*
15. Non-Involved Behaviors	.0000	.000	1.0000	2.105	-2.60*

Items	Expository Method		Non-Expository Method		t Values
	$\bar{X}$	SD	$\bar{X}$	SD	
16. Disrupting Behaviors	.0000	.000	.5500	1.734	-1.74
17. Irrelevant Behaviors	.0000	.000	.4000	1.283	-1.71
18. Non-Approach To Learning Behaviors	.0000	.000	.1833	.444	-2.26*

*Significant at the .05 level of confidence

APPENDIX II

Development of the Classroom Interaction Analysis Index

The Classroom Interaction Analysis Index (CIAI) was developed as a result of a perceived need for an instrument which would help an observer categorize the actions of teachers and students as they interact in classroom situations. The senior researcher first began to develop an analysis index in 1971. The first instrument evolved was called the Analysis of Teaching Index (ATI). The ATI has been used by several observers on both live classrooms and on video-taped lessons. Norms were developed for it, consequently it was with great reluctance that it was revised and remade into the present instrument.

The ATI was developed by adapting the seven items used by John Withall and Robert Ribble in their instrument, the Social-Emotional Climate Index, and six items used by Anita Simon and Yvonne Agazarian in the Sequential Analysis of Verbal Interaction. Three items directly related to teacher introduction of, development of, and closure of subject matter were added to make up the 16 items of the ATI.

Users of the ATI found it to be a great improvement over some earlier instruments since it provided for categorization of many kinds of teacher actions and behaviors and many kinds of student behaviors, not just verbal behaviors. Use of the ATI pointed up the need for rearranging the items in a more logical fashion and the need for the addition of several items. These considerations led the senior researcher to revise the ATI into the Classroom Interaction Analysis Index; but, there was an even greater need for a definition of the teacher and student behaviors which are classified in each item. Such a definition follows.

There are two broad categories of action or behavior used in the instrument. The first of these includes all teacher behaviors. The second includes all student behaviors. Evaluators using the original instrument had difficulty with these two broad categories when a student was making a presentation. Most evaluators view studetns who are making a presentation as a teacher, thus student behaviors, in such situations are recorded in the appropriate items comprising Category I. The responses of other students are recorded in Category II. Each evaluator must decide for himself where to record the behaviors of a student who is making a presentation or leading a discussion. When the instrument is used to analyze behaviors in team teaching situations, the user must make decisions about where to record them. The purpose of the instrument is to provide for analysis of all kinds of classroom behaviors that occur during an entire lesson.

GUIDE TO USE OF THE

CLASSROOM INTERACTION ANALYSIS INDEX

I. Teacher Actions or Behaviors

A. Subject Matter Oriented Teacher Behaviors

1. The teacher introduces a concept, skill, fact, or experience.

"The topic for discussion today is...", "The idea is...", "Lets look at the following."

2. The teacher explains, clarifies, or develops the lesson by statement, question, example, demonstration, or other action.

"Let me try to clarify that", "Here let me explain", "Look at it this way", and "Watch carefully and you will understand."

3. The teacher summarizes, concludes, or brings about closure of a topic or lesson by statement, question, or otherwise.

"In conclusion", "This now leads us to the following thought", "If these facts are true, what does that lead you to believe?"

B. Neutral Teacher Behaviors

4. The teacher says or does something that neither adds to the lesson nor takes anything from it.

The teacher may instruct someone to open the door or make a statement on a subject not under discussion.

C. Teacher Supportive Behaviors or Actions

5. The teacher gives directions or asks directive questions.

"Read page 32", "Write an essay", "What do you want me to explain more fully?"

6. The teacher makes statements or asks questions that tend to support himself, i.e., teacher ego reinforcing.

"I know that is correct", "What was the main idea of the discussion today."

7. The teacher makes disparaging, reproving, or discouraging statements (or questions) of a student or group of students.

   "Now if you had listen better", "Don't interrupt when I am talking", "Stop talking and listen".

D. Learner Oriented Teacher Behaviors

8. The teacher makes statements or asks questions which support student questions, statements, or actions.

   "Thats a very good question", "What do you think", "That's right".

9. The teacher shows acceptance of student questions, statements, answers, or actions by adding something to them, or by other types of approval.

   "That's a good question and it leads us to", "Right Johnny, now doesn't that make you wonder".

10. The teacher supports students by making problem structuring statements or asking problem structuring questions.

    "If that is true, what do you think about the following", "Suppose you were placed in the following situation, what would you do?"

II. Learner Behaviors or Actions

E. Indicators of Student Approaches to Learning

11. A student asks a clarifying or elaborating question or makes such a statement.

    "What do you mean", "If that is true, is it also true...", "How do you work this problem".

12. A student offers a positive comment or makes a positive response to a question.

    "Thats right teacher, and did you know", "The answer to that question is...".

13. A student asks where more information can be obtained, or how to obtain more information.

    "Where can I find out about that", "Are there books in the library on that subject".

14. A student responds positively to a question or statement made by another student, without going through the teacher.

    "Hey Billy, that's right", "Yes teacher, explain that to all of us".

F. Indicators of Student Avoidance of Learning

15. Students show lack of interest by registering boredom.

    The student puts head on desk, sleeps, yawns excessively, or does something other than does work.

16. Students show lack of interest by attempts to disrupt the lesson.

    The student throws paper, pick at other students, or argues with the teacher.

17. A student changes the subject, makes an irrelevant comment, or asks an irrelevant question.

    This item is self explanatory.

18. A student, or several students, shows reluctance to learn a concept, fact, skill, or attitude. (This may be by pretending not to understand when in fact the student does understand).

    The student may repeatedly ask a question even though it has been explained and it is apparent he understands.

CLASSROOM INTERACTION ANALYSIS INDEX*

Teacher Actions or Behaviors

Subject Matter Oriented Teacher Behaviors

Item 1. The teacher introduces a concept, skill, fact, or experience.

_____

_____

Item 2. The teacher explains, clarifies, or develops the lesson by statement, question, example, demonstration, or other action.

_____

_____

Item 3. The teacher summarizes, concludes, or brings about closure of a topic or lesson by statement, question, or otherwise.

_____

_____

Neutral Teacher Behaviors

Item 4. The teacher says or does something that neither adds to the lesson nor takes anything from it.

_____

_____

Teacher Supportive Behaviors or Actions

Item 5. The teacher gives directions or asks directive questions.

_____

_____

Item 6. The teacher makes statements or asks questions that tend to support himself, i.e., teacher ego reinforcing.

_____

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Item 7. The teacher makes disparaging, reproving, or discouraging statements (or questions) of a student or group of students.

_____

_____

Learner Oriented Teacher Behaviors

Item 8. The teacher makes statements or asks questions which support student questions, statements, or actions.

_____

_____

Item 9. The teacher shows acceptance of student questions, statements, answers, or actions by adding something to them, or by other types of approval.

_____

_____

Item 10. The teacher supports students by making problem structuring statements or asking problem structuring questions.

_____

_____

Learner Behaviors or Actions

Indicators of Student Approaches to Learning

Item 11. A student asks a clarifying or elaborating question or makes such a statement.

_____

_____

Item 12. A student offers a positive comment or makes a positive response to a question.

_____

_____

Item 13. A student asks where more information can be obtained, or how to obtain more information.

_____

_____

Item 14. A student responds positively to a question or statement made by another student, without going through the teacher.

_____

_____

Indicators of Student Avoidance of Learning

Item 15. Students show lack of interest by registering boredom.

_____

_____

Item 16. Students show lack of interest by attempts to disrupt the lesson.

_____

_____

Item 17. A student changes the subject, makes an irrelevant comment, or asks an irrelevant question.

_____

_____

Item 18. A student, or several students, shows reluctance to learn a concept, fact, skill, or attitude. (This may be by pretending not to understand when in fact the student does understand).

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